25

## WHAT IS CLAIMED IS:

- 1. A method for delivering a physiologically active compound to a patient comprising the steps of:
- (a) heating the physiologically active compound to a temperature and for a duration that results in an acceptably low level of decomposition;
- (b) simultaneously passing a gas across the surface of said compound to achieve a desired rate of vaporization; and
  - (c) administering the resulting aerosol to a patient.
  - 2. The method of claim 1 wherein said gas is air.
  - 3. The method of claim 2 wherein said air is at ambient temperature.
- 4. The method of claim 2 wherein air is passed across said surface at a rapid rate.
- 5. The method of claim 4 wherein the rapid rate does not result in a large rise in the air temperature.
- 15 6. The method of claim 4 wherein the rapid rate does not result in said compound being blown downstream with the air without being first vaporized.
  - 7. The method of claim 2 wherein the vaporized compound is rapidly mixed into the air to cool and preclude additional decomposition of said compound.
- 8. The method of claim 7 wherein the resulting mixture of said vaporized compound and air is further mixed into an additional air stream to further cool and preclude additional decomposition of said compound.
  - 9. The method of claim 4 wherein the rapid rate of air passing across said surface is caused by inhalation through the device by the patient.
  - 10. The method of claim 2 wherein the air passing across said surface is generated by mechanical means.
    - 11. The method of claim 1 wherein said compound is moved into a region of rapid gas movement and heated so that the said compound vaporizes at the lowest possible temperature.

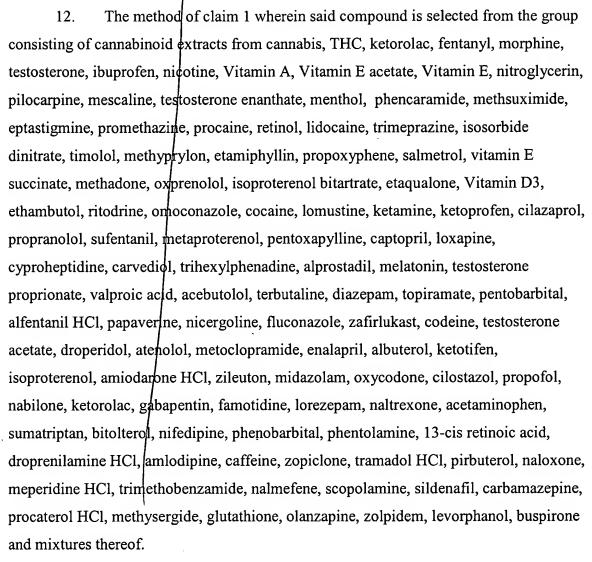
10

15

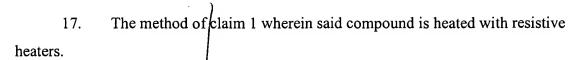
20

25





- 13. The method of claim 12 wherein said gas is air.
- 14. The method/of claim 5 wherein said compound is contained in a heating-vaporization-mixing zone having a sufficiently restricted cross-sectional area to increase the rate of air passing across said compound and to achieve the desired rate of vaporization.
- 15. The method of claim 14 wherein the mixing zone is designed to rapidly cool the vaporized compound,
- 16. The method of claim 1 wherein said compound is heated with photon energy.



- 18. The method of claim 1 wherein said compound is heated by inductive means.
- 19. A method for delivering a physiologically active compound to a patient comprising the steps of:
- (a) heating the physiologically active compound to a temperature and for a duration that results in an acceptably low level of decomposition;
- (b) simultaneously passing a gas across the surface of said compound, said compound being contained in a heating-vaporization-mixing zone having a sufficiently restricted cross-sectional area to increase the rate of gas passing across said compound and to achieve a desired rate of vaporization;
  - (c) rapidly mixing the vaporized compound into the gas to cool and preclude additional decomposition of said compound; and
    - (d) administering the resulting aerosol to a patient.
    - 20. The method of claim 19 wherein said gas is air.
    - 21. The method of claim 20 wherein said air is at ambient temperature.
  - 22. The method of claim 19 wherein the rapid rate of air passing across said surface is caused by the inhalation of the patient.
  - 23. The method of claim 22 wherein the rapid rate does not result in a pressure drop across the restricted cross-sectional area of greater than about 10 inches of water.
  - 24. A method for delivering a physiologically active compound to a patient comprising the steps of:
    - (a) depositing the physiologically active compound onto a substrate;
- 25 (b) feeding the substrate into a heating-vaporization-mixing zone while insuring a high level of vaporization by simultaneously passing a gas across the surface of said compound thereby insuring vaporization at the lowest possible temperature and shortest duration to achieve an acceptable level of decomposition;

D

5

15

20

25

- (c) mixing the variorized compound into the gas to rapidly cool and minimize decomposition of said compound; and
  - (d) administering the resulting aerosol to a patient.
- 25. The method/of claim 24 wherein said heating-vaporization-mixing zone
  has a sufficiently restricted cross-sectional area to increase the rate of gas passing across said compound and to achieve the highest possible rate of vaporization.
  - 26. The method of claim 24 wherein said gas is air.
  - 27. The method of claim 26 wherein said air is at ambient temperature.
  - 28. The method of claim 26 wherein the rapid rate of air passing across said surface is caused by inhalation though the device by the patient.
  - 29. The method of claim 24 wherein said compound is heated with photon energy.
  - 30. The method of claim 24 wherein said compound is heated with resistive heaters.
- The method of claim 24 wherein said compound is heated by inductive means.
  - 32. The method of/claim 31 wherein said substrate is a metallic foil.
  - 33. The method of claim 32 wherein said substrate is a stainless steel foil.
  - 34. The method of claim 33 wherein said compound is deposited onto said stainless steel foil at a thickness of no greater than about 10 microns.
  - 35. A method for delivering a physiologically active compound to a patient comprising the steps of:
    - (a) depositing the physiologically active compound onto a substrate;
  - (b) rapidly heating all of said compound to result in an acceptably low level of decomposition:
  - (c) simultaneously passing a gas across the surface of said compound to insure:
    - (i) a high level of vaporization of at least a portion of said compound, and

10

15

20

- (ii) rapid cooling of the vaporized compound to result in an acceptably low level of decomposition, and
  - (d) administering the resulting aerosol to a patient.
- 36. The method of claim 35 wherein all of the compound is heated at the same rate.
- 37. The method of claim 35 wherein the compound is heated to the point of vaporization between 1 and 10 milliseconds.
- 38. The method of claim 35 wherein the compound is heated to the point of vaporization between about 10 and about 100 milliseconds.
- 39. The method of claim 35 wherein the compound in deposited onto a substrate having a surface area up to one meter square.
- 40. The method of claim 39 wherein the substrate is porous and allows for the passing of the gas through the substrate.
- 41. The method of claim 40 wherein the substrate is constructed and positioned in the gas stream so that said compound is vaporized into a small volume of gas.
- 42. The method of claim 35 wherein the compound is heated by heating the substrate on which the compound is deposited.
- 43. The method of claim 42 wherein the substrate is heated by making the substrate from an electrically conductive material and passing an electrical current though the substrate.
- 44. The method of claim 35 wherein the portion of the compound that is vaporized is all vaporized at close to the same rate.
- 45. The method of claim 42 wherein the substrate is made of an electrically conductive material and is heated inductively.
- The method of claim 35 wherein the gas is passed across the entire surface of the substrate.
- 47. The method of claim 35 wherein the gas is passed across a portion of the surface of the substrate.

£ 65

15

20

25

48. A device for delivering a physiologically active compound to a patient comprising:

٠ )

- (a) a housing having an outlet;
- (b) a heating system for heating the physiologically active compound to a
   temperature and for a duration that results in an acceptably low level of decomposition while simultaneously passing a gas across the surface of said compound;
  - (c) a venturi tube having a throat containing said compound within said housing and connected to the outlet, said throat having a sufficiently restricted cross-sectional area to result in a desired high level of vaporization of said compound by increasing in the rate of the gas passing through said throat and across the surface of said compound; and
  - (d) an actuator operably coupled to said heater system and capable of activating said heater system.
  - 49. The device of claim 48 wherein the compound is placed on a flat surface that is mechanically moved into said throat.
  - 50. The device of claim 48 wherein said venturi tube has an inlet passage connected to said throat and an outlet passage connecting said throat with said outlet.
  - 51. The device of claim 48 wherein the rate of gas does not result in a pressure drop across the venturi type of greater than about 10 inches of water.
  - 52. The device of claim 48 wherein the entire compound is vaporized in less than 2 seconds.
    - 53. The device of claim 48 wherein any particular portion of the compound experiences a temperature heat up time to the point of vaporization in less than 0.1 second.
  - 54. The device of claim 50 wherein air is the gas that enters the inlet passage and passes through said throat, said outlet passage and said outlet.
    - 55. The device of claim 48 wherein said actuator is activated by the inhalation of the patient and drawing air through said throat.

15

20

- 56. The device of claim 48 wherein said actuator is manually activated by the patient.
- 57. The device of claim 48 wherein said heater means for heating is an inductive heater generating an alternating magnetic field.
- 58. The device of claim 77 wherein the frequency of said magnetic field is maintained at less than 1 MHz.
- 59. The device of claim 57 wherein the frequency of said magnetic field is maintained between about 100 and about 300 kHz.
- 60. A device for delivering a physiologically active compound to a patient comprising:
  - (a) a housing having an outlet;
  - (b) a heating system for heating said compound to a temperature that results in an acceptably low level of decomposition while simultaneously passing a gas across the surface of said compound;
  - (c) a heating-vaporization-mixing zone containing said compound within said housing and connected to the outlet;
  - (d) a chamber of compressed gas having a valve and connected to said heating-vaporization-mixing zone for directing a stream of gas at said compound and across the compound's surface to result in a desired high level of vaporization of said compound by increasing the rate of the gas passing across the surface of said compound; and
  - (e) an actuator operably coupled to and capable of activating said heater system.
- The device of claim 60 wherein a tube within said housing having an inlet passage connected to said heating-vaporization-mixing zone and an outlet passage connected to said outlet.
  - The device of claim 61 wherein air is the gas that is in said chamber and enters said inlet passage and passes through said heating-vaporization-mixing zone, said outlet passage and said outlet.

SFO 4045783v6

20

- 63. The device of claim 60 wherein said actuator is activated by the inhalation of the patient.
- 64. The device of claim 60 wherein said actuator is manually activated by the patient.
- 65. The device of claim 60 wherein said actuator is activated by the inhalation of the patient.
  - 66. A device for delivering a physiologically active compound to a patient comprising:
    - (a) a housing having an outlet;
- 10 (b) a first tube within said housing through which a first gas stream is passed, having a filter at each end and containing a plurality of particles, each particle having a large surface area to mass ratio and a coating of a physiologically active compound;
- (c) a heating system for heating said compound to a temperature that

  results in an acceptably low level of decomposition while simultaneously passing the first gas stream through said first tube and over the surface of the coated particles;
  - (d) a second tube connected to said outlet through which a second gas stream is passed and combined with a mixture of the vaporized compound and the first gas stream from said first tube; and
  - (e) an actuator operably coupled to and capable of activating said heater system.
  - 67. The device of claim 66 wherein the particles are selected from the group consisting of aluminum oxide, silica, coated silica, carbon, graphite, diatomaceous earth, and mixtures thereof.
- 25 68. The device of claim 66 wherein the compound is heated by heating the gas in the first tube and then passing the heated gas over the compound.
  - 69. A device for delivering a physiologically active compound to a patient comprising:
    - (a) a housing having an outlet;

10

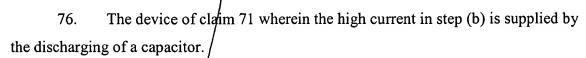
20

- (b) a venturi tube within said housing and having a throat containing said compound coated on its interior surface and connected to the outlet, said throat having a sufficiently restricted cross-sectional area to result in a desired high level of vaporization of said compound and an increase in the rate of the gas passing through said throat and across the surface of said compound;
- (c) a heating/system for heating said compound to a temperature by discharging electrical energy through said tube that results in an acceptably low level of decomposition while simultaneously passing a gas across the surface of said compound; and
- (d) an actuator operably coupled to said heater means for activating said heater system.
  - 70. The device of claim 69 wherein the rate of gas does not result in a pressure drop across the venturi tube of greater than about 10 inches of water.
- 71. A device for delivering a physiologically active compound to a patient comprising:

(a) depositing a physiologically active compound onto an electrically conductive mesh or screen carrier;

(b) rapidly heating the carrier by passing a high current across the carrier to vaporize at least a portion of the compound, while simultaneously passing a gas through the screen thereby mixing the resulting vapor with the gas; and

- (c) administering the resulting mixture to a patient.
- 72. The device of claim 71 wherein the carrier is a single layer of stainless steel mesh.
- 73. The device of claim 71 wherein the carrier is made of multiple layers of material.
  - 74. The device of claim 73 wherein the stainless steel mesh is a fine mesh
  - 75. The device of claim 74 wherein the stainless steel mesh is in the range of about 100 to about 400 mesh.



- 77. The device of daim 71 wherein the current supplied is for less than about 20 milliseconds.
- 78. The device of claim 71 wherein the current supplied is from between about 2 and about 10 milliseconds.
- 79. The device of claim 71 wherein the substrate is heated inductively instead of directly passing the current though the substrate.
  - 80. The method for generating an aerosol comprising the steps of:
- (a) heating the physiologically active compound to a temperature and for a duration that results in an acceptably low level of decomposition;
- (b) simultaneously passing a gas across the surface of said compound to achieve a desired rate of vaporization; and
  - (c) administering the resulting aerosol to an organ or tissue of a patient.
  - 81. The method of claim 80 wherein the aerosol is administered to the eye.
  - The method of claim 80 wherein the aerosol is administered to the skin.
- 83. The method of claim 80 wherein the aerosol is administered to the mucosa.

10

20